

**SEARCH REQUEST FORM****Scientific and Technical Information Center**

Requester's Full Name: LEE, R. A. Examiner #: 78630 Date: 07-12-2004  
 Art Unit: \_\_\_\_\_ Phone Number 30 \_\_\_\_\_ Serial Number: 10/679,239  
 Mail Box and Bldg/Room Location: \_\_\_\_\_ Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: NUCLEATING ADDITIVE FORMULATIONS

Inventors (please provide full names): MANNION, Michael J.

JONES, Jeffrey R.

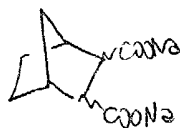
Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please search polymer compositions containing bicyclo [2.2.1] heptane  
 dicarboxylic acid derivatives (norbornene)



X = H, organic, inorganic cation (ie, Na<sup>+</sup>)  
 fragment

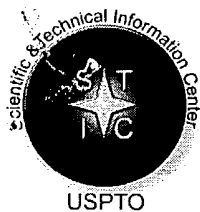


also known as HPN-68<sup>®</sup>  
 (Milliken & Co.)

\*\*\*\*\*

**STAFF USE ONLY**

|  | Type of Search         | Vendors and cost where applicable |
|--|------------------------|-----------------------------------|
| Searcher: <u>R. Fuller</u>             | NA Sequence (#) _____  | STN <u>✓</u>                      |
| Searcher Phone #: _____                | AA Sequence (#) _____  | Dialog _____                      |
| Searcher Location: _____               | Structure (#) <u>1</u> | Questel/Orbit _____               |
| Date Searcher Picked Up: _____         | Bibliographic _____    | Dr. Link _____                    |
| Date Completed: <u>7/14/04</u>         | Litigation _____       | Lexis/Nexis _____                 |
| Searcher Prep & Review Time: <u>20</u> | Fulltext _____         | Sequence Systems _____            |
| Clerical Prep Time: _____              | Patent Family _____    | WWW/Internet _____                |
| Online Time: <u>25</u>                 | Other _____            | Other (specify) _____             |



# **STIC Search Report**

## **EIC 1700**

**STIC Database Tracking Number: 126969**

**TO: Rip A Lee**  
**Location: REM 10A24**  
**Art Unit : 1713**  
**July 14, 2004**

**Case Serial Number: 10/679239**

**From: Kathleen Fuller**  
**Location: EIC 1700**  
**REMSSEN 4B28**  
**Phone: 571/272-2505**  
**Kathleen.Fuller@uspto.gov**

### **Search Notes**



# STIC Search Results Feedback Form

**EIC17000**

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader  
571/272-2505 REMSEN 4B28

## Voluntary Results Feedback Form

- I am an examiner in Workgroup:  Example: 1713
- Relevant prior art **found**, search results used as follows:
- ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
  - ☐ Non-Patent Literature  
(journal articles, conference proceedings, new product announcements etc.)
- Relevant prior art **not found**:
- ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28



=> set cost off  
SET COMMAND COMPLETED

=> file reg  
FILE 'REGISTRY' ENTERED AT 15:55:51 ON 14 JUL 2004  
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Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 13 JUL 2004 HIGHEST RN 709042-93-3  
DICTIONARY FILE UPDATES: 13 JUL 2004 HIGHEST RN 709042-93-3

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2004

Please note that search-term pricing does apply when conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more information enter HELP PROP at an arrow prompt in the file or refer to the file summary sheet on the web at:  
<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> file hcasplu  
'HCASPLU' IS NOT A VALID FILE NAME  
SESSION CONTINUES IN FILE 'REGISTRY'  
Enter "HELP FILE NAMES" at an arrow prompt (=>) for a list of files that are available. If you have requested multiple files, you can specify a corrected file name or you can enter "IGNORE" to continue accessing the remaining file names entered.

=> file hcapl  
FILE 'HCAPLUS' ENTERED AT 15:56:01 ON 14 JUL 2004  
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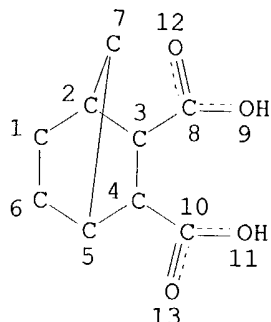
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FILE COVERS 1907 - 14 Jul 2004 VOL 141 ISS 3  
FILE LAST UPDATED: 13 Jul 2004 (20040713/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d que

L3 STR



*243 structures from  
the query*

NODE ATTRIBUTES:  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RSPEC I  
NUMBER OF NODES IS 13

STEREO ATTRIBUTES: NONE

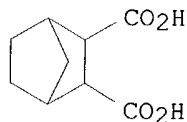
L6 243 SEA FILE=REGISTRY SSS FUL L3  
L7 58 SEA FILE=REGISTRY ABB=ON L6 AND PMS/CI  
L12 18 SEA FILE=HCAPLUS ABB=ON L7  
L13 0 SEA FILE=HCAPLUS ABB=ON L12 AND NUCLE?  
L14 3 SEA FILE=HCAPLUS ABB=ON L12 AND (THERMOPLAS? OR POLYOLEFIN?  
OR POLYPROPYLENE OR PP OR PE OR POLYETHYLENE OR POLYBUTYLENE)  
L15 3 SEA FILE=HCAPLUS ABB=ON L13 OR L14  
L16 168 SEA FILE=HCAPLUS ABB=ON L6  
L17 17 SEA FILE=HCAPLUS ABB=ON L16 AND NUCLE?  
L18 6 SEA FILE=HCAPLUS ABB=ON L6(L)MOA/RL  
L19 6 SEA FILE=HCAPLUS ABB=ON L17 AND (PLASTIC? OR POLYMER?)/SC,SX  
L20 11 SEA FILE=HCAPLUS ABB=ON L16 AND (THERMOPLAS? OR POLYOLEFIN?  
OR POLYPROPYLENE OR PP OR PE OR POLYETHYLENE OR POLYBUTYLENE)  
L21 11 SEA FILE=HCAPLUS ABB=ON L15 OR (L18 OR L19 OR L20)

*58 polymers*

=> d l21 all hitstr 1-11

L21 ANSWER 1 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2003:1007880 HCAPLUS  
DN 140:43158  
ED Entered STN: 28 Dec 2003  
TI Bimolecular **nucleation** methods for **thermoplastics**  
IN Dotson, Darin L.; Mehl, Nathan A.; Burkhardt, Brian M.; Xu, Jiannong  
PA USA  
SO U.S. Pat. Appl. Publ., 12 pp.  
CODEN: USXXCO  
DT Patent  
LA English  
IC ICM C08K005-09  
ICS C08K005-04  
NCL 524285000; 524394000  
CC 37-6 (**Plastics** Manufacture and Processing)  
FAN.CNT 1

|      | PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|------|--|------|----------|-----------------|----------|
| PI   | US 2003236332  | A1   | 20031225 | US 2002-172338  | 20020614 |
| PRAI | US 2002-172338   |      | 20020614 |                 |          |
| OS   | MARPAT 140:43158   |      |          |                 |          |
| AB   | <p>Specific methods of inducing high <b>nucleation</b> rates in <b>thermoplastics</b>, such as <b>polyolefins</b>, and particularly, though not necessarily, polypropylenes, through the introduction of two different compds. that are substantially soluble within the target molten <b>thermoplastic</b> resin (such as, as one non-limiting example, an added compound including at least one acid group and an added organic salt) are provided. Such introduced components react to form a <b>nucleating</b> agent in situ within such a target molten <b>thermoplastic</b> resin which is then allowed to cool. Preferably, one compound is an acid, preferably bicyclic (i.e., two cyclic systems sharing at least three carbon atoms) or monocycloaliph. (i.e., a single, saturated ring system) in nature, such as, without limitation, bicyclo[2.2.1]heptane dicarboxylic acid or hexahydrophthalic acid, and the other compound is an organic salt, such as a carboxylate, sulfonate, phosphate, oxalate, and the like, and more preferably selected from the group consisting of metal C 8 -C 22 esters. Such a production method thus provides a manner of generating in situ the desired <b>nucleating</b> agent through reaction of such soluble compds. Kits (e.g., masterbatch methods, for example) comprising such components for easy introduction within target molten <b>polyolefin</b> resins are also contemplated within this invention. Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid and Ca stearate were used in <b>nucleation</b> of <b>polypropylene</b>.</p> |      |          |                 |          |
| ST   | <b>thermoplastic</b> crystal <b>nucleation</b> agent bimol   |      |          |                 |          |
| IT   | Crystal <b>nucleating</b> agents<br>(bimol. <b>nucleation</b> methods for <b>thermoplastics</b> )  |      |          |                 |          |
| IT   | <b>Polyolefins</b><br>RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PYP (Physical process); PROC (Process); USES (Uses)<br>(bimol. <b>nucleation</b> methods for <b>thermoplastics</b> )  |      |          |                 |          |
| IT   | Plastics, uses<br>RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PYP (Physical process); PROC (Process); USES (Uses)<br>( <b>thermoplastics</b> ; bimol. <b>nucleation</b> methods for <b>thermoplastics</b> )   |      |          |                 |          |
| IT   | 557-05-1 822-16-2, Sodium Stearate 1592-23-0 1687-30-5, Hexahydrophthalic acid 1724-08-9, Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid 3853-88-1 4485-12-5, Lithium Stearate<br>RL: MOA (Modifier or additive use); USES (Uses)<br>(bimol. <b>nucleation</b> methods for <b>thermoplastics</b> )  |      |          |                 |          |
| IT   | 9003-07-0, <b>Polypropylene</b> 9010-79-1, Ethylene-propylene copolymer 25085-53-4, Profax 6301<br>RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PYP (Physical process); PROC (Process); USES (Uses)<br>(bimol. <b>nucleation</b> methods for <b>thermoplastics</b> )   |      |          |                 |          |
| IT   | 1724-08-9, Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid<br>RL: MOA (Modifier or additive use); USES (Uses)<br>(bimol. <b>nucleation</b> methods for <b>thermoplastics</b> )   |      |          |                 |          |
| RN   | 1724-08-9 HCAPLUS  |      |          |                 |          |
| CN   | Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid (9CI) (CA INDEX NAME)  |      |          |                 |          |



L21 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN  
 AN 2003:837152 HCAPLUS  
 DN 139:324226  
 ED Entered STN: 24 Oct 2003  
 TI Highly **nucleated** syndiotactic **polypropylene** and its  
 production  
 IN Dotson, Darin L.  
 PA Milliken & Company, USA  
 SO PCT Int. Appl., 24 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C08F110-06  
 ICS C08K005-15; C08K003-00; C08K005-09; C08K005-10; C08K005-12  
 CC 37-6 (**Plastics** Manufacture and Processing)  
 FAN.CNT 1

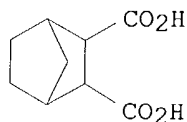
| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| PI WO 2003087175  | A1   | 20031023 | WO 2003-US10522 | 20030407 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM |      |          |                 |          |
| RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG  |      |          |                 |          |
| US 2003199658   | A1   | 20031023 | US 2002-121224  | 20020412 |
| US 6703434  | B2   | 20040309 |                 |          |
| US 6642290  | B1   | 20031104 | US 2002-121400  | 20020412 |
| US 2003236344   | A1   | 20031225 | US 2003-606006  | 20030625 |
| US 2004010107   | A1   | 20040115 | US 2003-609080  | 20030627 |
| PRAI US 2002-121224   | A    | 20020412 |                 |          |
| US 2002-121400  | A    | 20020412 |                 |          |

OS MARPAT 139:324226

AB The presence of certain novel **nucleating** agents within molten syndiotactic resins permits the resultant molten mixture to cool into a selected shape or configuration. These **nucleating** agents are new classes of hyper-**nucleators**, bicyclic or monocyclic dicarboxylic acid salts that promote crystallization within syndiotactic resins at levels well above any previously disclosed **nucleators**. The title **polypropylene** containing 0.25% cis calcium hexahydrophthalate showed a peak crystallization temperature 77° and flexural modulus 944 MPa; vs. 64 and 844, resp., for Na benzoate.

ST hexahydrophthalate calcium salt **nucleator** syndiotactic **polypropylene**

IT Crystal **nucleating** agents  
(**nucleating** agents for syndiotactic **polypropylene**)  
IT **23838-83-7P** 491589-22-1P  
RL: IMF (Industrial manufacture); **MOA** (Modifier or additive use)  
; PREP (Preparation); USES (Uses)  
(**nucleating** agents for syndiotactic **polypropylene**)  
IT 26063-22-9, Syndiotactic **polypropylene**  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP  
(Physical process); PROC (Process)  
(**nucleating** agents for syndiotactic **polypropylene**)  
IT 23838-82-6  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reduction; **nucleating** agents for syndiotactic  
**polypropylene**)  
RE.CNT 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
(1) Zhao; US 20030073764 A1 2003  
IT **23838-83-7P**  
RL: IMF (Industrial manufacture); **MOA** (Modifier or additive use)  
; PREP (Preparation); USES (Uses)  
(**nucleating** agents for syndiotactic **polypropylene**)  
RN 23838-83-7 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, disodium salt (9CI) (CA  
INDEX NAME)



●2 Na

L21 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2003:154516 HCAPLUS  
DN 138:205801  
ED Entered STN: 28 Feb 2003  
TI Clarified **thermoplastics** exhibiting very high **nucleation**  
efficacy  
IN Zhao, Xiaodong E.  
PA Milliken & Company, USA  
SO PCT Int. Appl., 42 pp.  
CODEN: PIXXD2  
DT Patent  
LA English  
IC ICM C09J105-00  
ICS C08K005-04; C08K005-09; C08K005-15  
CC 37-2 (**Plastics** Manufacture and Processing)  
FAN.CNT 1

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| WO 2003016421   | A1   | 20030227 | WO 2002-US24354 | 20020801 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,<br>CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, |      |          |                 |          |



GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
 LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,  
 PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,  
 UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG,  
 CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,  
 PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,  
 NE, SN, TD, TG

US 2003073764 A1 20030417 US 2001-927710 20010811

US 6585819 B2 20030701

PRAI US 2001-927710 A 20010811

OS MARPAT 138:205801

AB Certain **thermoplastic** additives (combinations of clarifying and **nucleating** compds.) that induce simultaneously low clarity and high **nucleation** efficacy are provided. Such additives include combinations of certain bicyclic salts (which by themselves induce very high **nucleation** efficacy) and **thermoplastic** clarifying agents, including certain dibenzylidene sorbitol acetals and derivs. (DBSSs) (which alone provide very low haze measurements and thus highly desirable clarity characteristics). In comparison, other types of standard **thermoplastic nucleators**, such as sodium benzoate and sodium 2,2'-methylenebis(4,6-di-tert-butylphenyl) phosphate provide relatively high peak crystallization temps., but do not combine synergistically with clarifiers, such as DBSSs, to provide the same results as for the inventive combination of bicyclic salts and DBSSs. **Thermoplastic** compns. as well as **thermoplastic** additive packages comprising such inventive **nucleator** compds., as well as methods of producing **polypropylene** compns. and articles made therefrom, are also contemplated within this invention.

ST clarifier bicyclic salt dibenzylidene sorbitol acetal  
**thermoplastic nucleating agent**

IT Alditols

RL: MOA (Modifier or additive use); USES (Uses)  
 (acetals; manufacture of bicyclic salt- and sorbitol acetal-containing **nucleation** agents for **thermoplastics** with improved clarity)

IT Acetals

RL: MOA (Modifier or additive use); USES (Uses)  
 (alditol-based; manufacture of bicyclic salt- and sorbitol acetal-containing **nucleation** agents for **thermoplastics** with improved clarity)

IT Crystal **nucleating** agents

(bicyclic salt- and sorbitol acetal-containing **nucleation** agents for **thermoplastics** with improved clarity)

IT Plastics, properties

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)  
 (**thermoplastics**; bicyclic salt- and sorbitol acetal-containing **nucleation** agents for **thermoplastics** with improved clarity)

IT 25085-53-4, Profax 6301 486404-34-6, Indelpro SA 49F

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(bicyclic salt- and sorbitol acetal-containing **nucleation** agents for **thermoplastics** with improved clarity)

IT 19046-64-1 80124-42-1, 1,3:2,4-Di(p-ethylbenzylidene)sorbitol

81541-12-0, Millad 3940 81541-15-3 82203-22-3 82203-23-4,

1,3:2,4-Di(p-chlorobenzylidene)sorbitol 135861-56-2, Millad 3988

403842-20-6 403842-21-7 403842-25-1 461425-64-9 461425-65-0

|             |             |             |             |             |
|-------------|-------------|-------------|-------------|-------------|
| 461425-66-1 | 461425-67-2 | 461425-68-3 | 461425-69-4 | 461425-70-7 |
| 461425-71-8 | 461425-73-0 | 461425-74-1 | 461425-77-4 | 461425-78-5 |
| 461425-81-0 | 461425-85-4 | 464178-05-0 | 464178-06-1 | 464178-14-1 |
| 464178-15-2 | 464178-21-0 | 464178-22-1 | 464178-23-2 | 464178-24-3 |
| 464178-25-4 | 464178-26-5 | 464178-32-3 | 464178-33-4 | 464178-34-5 |
| 464178-35-6 | 464178-36-7 | 464178-40-3 | 464178-41-4 | 464178-46-9 |
| 464178-48-1 | 464178-49-2 | 464178-50-5 | 464178-51-6 | 464178-52-7 |
| 464178-54-9 | 485803-67-6 | 485803-68-7 | 485803-76-7 | 485803-77-8 |
| 486403-39-8 | 486403-50-3 | 499792-99-3 | 499793-00-9 | 499793-02-1 |
| 499793-03-2 | 499793-04-3 | 499793-05-4 | 500023-41-6 |             |

RL: MOA (Modifier or additive use); USES (Uses)

(manufacture of bicyclic salt- and sorbitol acetal-containing **nucleation** agents for **thermoplastics** with improved clarity)

IT 23838-83-7P

RL: IMF (Industrial manufacture); MOA (Modifier or additive use)  
; PREP (Preparation); USES (Uses)

(**nucleation** agent; manufacture of bicyclic salt- and sorbitol acetal-containing **nucleation** agents for **thermoplastics** with improved clarity)

IT 23838-82-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(starting material for **nucleation** agent; manufacture of bicyclic salt- and sorbitol acetal-containing **nucleation** agents for **thermoplastics** with improved clarity)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Amos; US 5981636 A 1999 HCAPLUS
- (2) Rekers; US 5049605 A 1991 HCAPLUS
- (3) Zhao; US 6465551 B1 2002 HCAPLUS

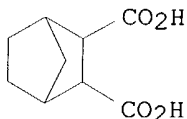
IT 23838-83-7P

RL: IMF (Industrial manufacture); MOA (Modifier or additive use)  
; PREP (Preparation); USES (Uses)

(**nucleation** agent; manufacture of bicyclic salt- and sorbitol acetal-containing **nucleation** agents for **thermoplastics** with improved clarity)

RN 23838-83-7 HCAPLUS

CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, disodium salt (9CI) (CA INDEX NAME)



● 2 Na

L21 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2002:907195 HCAPLUS

DN 138:5098

ED Entered STN: 29 Nov 2002

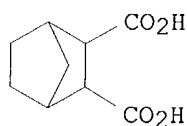
TI Novel **thermoplastic nucleating** compounds

IN Zhao, Xiaodong Edward; Dotson, Darin L.; Burkhardt, Brian M.; Jones, Jeffrey R.

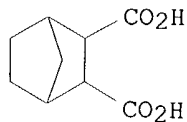
PA USA  
 SO U.S. Pat. Appl. Publ., 7 pp., Cont.-in-part of U. S. Ser. No. 815,832.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM C08K005-09  
 ICS C07C061-12  
 NCL 524285000; 562498000  
 CC 37-6 (**Plastics** Manufacture and Processing)  
 FAN.CNT 2

|      | PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|------|---|------|----------|-----------------|----------|
| PI   | US 2002177642   | A1   | 20021128 | US 2001-8322    | 20011103 |
|      | US 6599968  | B2   | 20030729 |                 |          |
|      | US 6465551  | B1   | 20021015 | US 2001-815832  | 20010324 |
|      | WO 2003040230   | A1   | 20030515 | WO 2002-US32411 | 20021009 |
|      | W:  |      |          |                 |          |
|      | AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  |      |          |                 |          |
|      | RW:   |      |          |                 |          |
|      | GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG  |      |          |                 |          |
| PRAI | US 2001-815832  | A2   | 20010324 |                 |          |
|      | US 2001-8322  | A    | 20011103 |                 |          |
| OS   | MARPAT 138:5098   |      |          |                 |          |
| AB   | Comps. and compns. comprising specific metal salts of bicyclo[2.2.1]heptane dicarboxylate salts in order to provide highly desirable properties within <b>polyolefin</b> articles are provided. The inventive salts and derivs. thereof are useful as <b>nucleating</b> and/or clarifying agents for such <b>polyolefin</b> , provide excellent crystallization temps., stiffness, and calcium stearate compatibility within target <b>polyolefin</b> . Also, such compds. exhibit very low hygroscopicity and therefore excellent shelf stability as powdered or granular formulations. <b>Polyolefin</b> additive compns. and methods of producing <b>polyolefin</b> with such compds. are also contemplated within this invention. |      |          |                 |          |
| ST   | bicycloheptane dicarboxylate <b>thermoplastic nucleating</b> compd  |      |          |                 |          |
| IT   | Crystal <b>nucleating</b> agents<br>(preparation of bicyclo[2.2.1]heptane dicarboxylate salt <b>nucleating</b> agents for <b>thermoplastic</b> articles)  |      |          |                 |          |
| IT   | Plastics, uses<br>RL: TEM (Technical or engineered material use); USES (Uses)<br>( <b>thermoplastics</b> ; preparation of bicyclo[2.2.1]heptane dicarboxylate salt <b>nucleating</b> agents for <b>thermoplastic</b> articles)  |      |          |                 |          |
| IT   | 476677-40-4P<br>RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)<br>(intermediate; preparation of bicyclo[2.2.1]heptane dicarboxylate salt <b>nucleating</b> agents for <b>thermoplastic</b> articles)  |      |          |                 |          |
| IT   | 1724-08-9P, Bicyclo[2.2.1]heptane-2,3-dicarboxylic Acid<br>465508-50-3P 465508-55-8P 465508-60-5P 466646-10-6P<br>466646-11-7P  |      |          |                 |          |

- RL: IMF (Industrial manufacture); MOA (Modifier or additive use)  
; PREP (Preparation); USES (Uses)  
(**nucleating** agent; preparation of bicyclo[2.2.1]heptane dicarboxylate salt **nucleating** agents for **thermoplastic** articles)
- IT 7440-05-3, Palladium, uses  
RL: CAT (Catalyst use); USES (Uses)  
(preparation of bicyclo[2.2.1]heptane dicarboxylate salt **nucleating** agents for **thermoplastic** articles)
- IT 25085-53-4, Profax 6301  
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)  
(preparation of bicyclo[2.2.1]heptane dicarboxylate salt **nucleating** agents for **thermoplastic** articles)
- IT 9003-07-0, **Polypropylene**  
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
(preparation of bicyclo[2.2.1]heptane dicarboxylate salt **nucleating** agents for **thermoplastic** articles)
- IT 57-88-5, Cholesterol, reactions 112-92-5, Stearyl alcohol 1310-65-2, Lithium hydroxide 1310-73-2, Sodium hydroxide, reactions 2746-19-2, Himic anhydride 6004-79-1, Bicyclo[2.2.1]heptane-2,3-dicarboxylic anhydride 8014-95-7, Fuming sulfuric acid 9003-13-8, Poly[propyleneoxide monobutylether **23838-83-7**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(starting material; preparation of bicyclo[2.2.1]heptane dicarboxylate salt **nucleating** agents for **thermoplastic** articles)
- IT **1724-08-9P**, Bicyclo[2.2.1]heptane-2,3-dicarboxylic Acid  
**465508-50-3P 465508-55-8P**  
RL: IMF (Industrial manufacture); MOA (Modifier or additive use)  
; PREP (Preparation); USES (Uses)  
(**nucleating** agent; preparation of bicyclo[2.2.1]heptane dicarboxylate salt **nucleating** agents for **thermoplastic** articles)
- RN 1724-08-9 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid (9CI) (CA INDEX NAME)

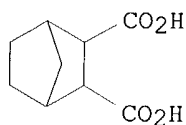


- RN 465508-50-3 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, monosodium salt (9CI) (CA INDEX NAME)



● Na

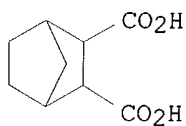
RN 465508-55-8 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, lithium sodium salt (9CI)  
(CA INDEX NAME)



● Li

● Na

IT **23838-83-7**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(starting material; preparation of bicyclo[2.2.1]heptane dicarboxylate salt  
**nucleating** agents for **thermoplastic** articles)  
RN 23838-83-7 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, disodium salt (9CI) (CA  
INDEX NAME)



●2 Na

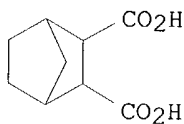
L21 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2002:906118 HCAPLUS  
DN 138:5089  
ED Entered STN: 29 Nov 2002  
TI Novel highly versatile **thermoplastic nucleators**

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

IN Zhao, Xiaodong Edward; Dotson, Darin L.  
 PA Milliken & Company, USA  
 SO PCT Int. Appl., 34 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C07C061-12  
 ICS C08K005-04; C08K005-09  
 CC 37-6 (Plastics Manufacture and Processing)  
 FAN.CNT 1

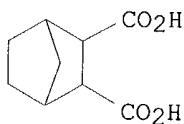
|      | PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|------|---|------|----------|-----------------|----------|
| PI   | WO 2002094759   | A1   | 20021128 | WO 2002-US6418  | 20020304 |
|      | W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG   |      |          |                 |          |
|      | US 2003008956   | A1   | 20030109 | US 2001-864460  | 20010523 |
|      | US 6559211  | B2   | 20030506 |                 |          |
|      | EP 1389178  | A1   | 20040218 | EP 2002-725063  | 20020304 |
|      | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR   |      |          |                 |          |
|      | US 2003096895   | A1   | 20030522 | US 2002-288040  | 20021105 |
| PRAI | US 2001-864460  | A    | 20010523 |                 |          |
|      | WO 2002-US6418  | W    | 20020304 |                 |          |
| OS   | MARPAT 138:5089   |      |          |                 |          |
| AB   | Bicyclic compound <b>nucleating</b> agents are reported which induces a peak crystallization temperature of $\geq 125^\circ$ for formulation of <b>polypropylene</b> with d. .apprx.0.9 g/cm <sup>3</sup> , melt flow 12 g/10 min, Rockwell hardness .apprx.90, tensile strength 4931 psi, elongation at yield .apprx.10%, flexural modulus 203 ksi, Izod impact strength 0.67 ft-lb/in, and deflection temperature at 0.46 mPa of .apprx.93°. Thus, a mixture of 1000 g <b>polypropylene</b> , 500 ppm Irganox 1010, 1000 ppm Irgafos 168, 800 ppm calcium stearate, and 1000 ppm disodium bicyclo[2.2.1]heptane-2,3-dicarboxylate (I) was compounded using single-screw extruder at 204-232° and injection molded into plaques with peak crystallization temperature 126° and haze 34%, compared with 110° and 68%, resp., for the sample obtained without I. |      |          |                 |          |
| ST   | bicyclic compd <b>nucleation</b> agent <b>polypropylene</b> ; disodium bicycloheptanedicarboxylate <b>nucleation</b> agent <b>polypropylene</b>   |      |          |                 |          |
| IT   | Polyesters, uses<br>RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)<br>(bicyclic compound <b>nucleation</b> agents for)   |      |          |                 |          |
| IT   | Crystal <b>nucleating</b> agents<br>(disodium and calcium bicycloheptanedicarboxylates; for <b>polypropylene</b> with high peak crystallization temperature)  |      |          |                 |          |
| IT   | 1592-23-0, Calcium stearate<br>RL: MOA (Modifier or additive use); USES (Uses)<br>(acid scavengers; bicyclic compound <b>nucleation</b> agents for <b>polypropylene</b> with high peak crystallization temperature containing)  |      |          |                 |          |
| IT   | 25085-53-4, Profax 6301<br>RL: POF (Polymer in formulation); TEM (Technical or engineered material  |      |          |                 |          |

use); USES (Uses)  
(bicyclic compound **nucleation** agents for)  
IT 23838-83-7 465508-47-8  
RL: MOA (Modifier or additive use); USES (Uses)  
(**nucleation** agents; for **polypropylene** with high  
peak crystallization temperature)  
RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
(1) Amos; US 5929146 A 1999 HCAPLUS  
(2) Amos; US 5981636 A 1999 HCAPLUS  
IT 23838-83-7 465508-47-8  
RL: MOA (Modifier or additive use); USES (Uses)  
(**nucleation** agents; for **polypropylene** with high  
peak crystallization temperature)  
RN 23838-83-7 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, disodium salt (9CI) (CA  
INDEX NAME)



● 2 Na

RN 465508-47-8 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, calcium salt (1:1) (9CI) (CA  
INDEX NAME)



● Ca

L21 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2002:754474 HCAPLUS  
DN 137:279981  
ED Entered STN: 04 Oct 2002  
TI Bicyclo[2.2.1]heptane dicarboxylate salt **nucleating** agents for  
**thermoplastic** articles  
IN Zhao, Xiaodong Edward; Dotson, Darin L.; Morin, Brian G.; Burkhart, Brian  
M.; Cowan, Martin E.; Jones, Jeffrey R.  
PA Milliken & Company, USA  
SO PCT Int. Appl., 41 pp.  
CODEN: PIXXD2  
DT Patent

LA English  
 IC ICM C08K005-09  
 ICS C08K005-092; C08K005-095; C08K005-098; C07C069-753  
 CC 37-6 (Plastics Manufacture and Processing)  
 FAN.CNT 2

|      | PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|------|--|------|----------|-----------------|----------|
| PI   | WO 2002077092  | A1   | 20021003 | WO 2002-US6493  | 20020305 |
|      | W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG  |      |          |                 |          |
|      | US 6465551   | B1   | 20021015 | US 2001-815832  | 20010324 |
|      | US 6534574   | B1   | 20030318 | US 2001-995315  | 20011127 |
|      | EP 1373396   | A1   | 20040102 | EP 2002-725071  | 20020305 |
|      | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR  |      |          |                 |          |
|      | BR 2002008340  | A    | 20040323 | BR 2002-8340    | 20020305 |
| PRAI | US 2001-815832   | A    | 20010324 |                 |          |
|      | US 2001-995315   | A    | 20011127 |                 |          |
|      | WO 2002-US6493   | W    | 20020305 |                 |          |
| OS   | MARPAT 137:279981  |      |          |                 |          |
| AB   | Compds. and compns. comprising specific metal salts of bicyclo[2.2.1]heptane dicarboxylate salts in order to provide highly desirable properties within <b>polyolefin</b> articles are provided. The inventive salts and derivs. thereof are useful as <b>nucleating</b> and/or clarifying agents for such <b>polyolefin</b> , provide excellent crystallization temps., stiffness, and calcium stearate compatibility within target <b>polyolefin</b> . Also, such compds. exhibit very low hygroscopicity and therefore excellent shelf stability as powdered or granular formulations. <b>Polyolefin</b> additive compns. and methods of producing <b>polyolefin</b> with such compds. are also contemplated within this invention. Disodium bicyclo[2.2.1]heptane-2, 3-dicarboxylate was prepared and used as a <b>nucleating</b> agent for <b>polypropylene</b> . |      |          |                 |          |
| ST   | bicycloheptane dicarboxylate salt <b>nucleating</b> agent <b>thermoplastic</b>   |      |          |                 |          |
| IT   | Crystal <b>nucleating</b> agents<br>(bicyclo[2.2.1]heptane dicarboxylate salt <b>nucleating</b> agents for <b>thermoplastic</b> articles)  |      |          |                 |          |
| IT   | Polyesters, properties<br><b>Polyolefins</b><br>Polypropene fibers, properties<br>RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)<br>(bicyclo[2.2.1]heptane dicarboxylate salt <b>nucleating</b> agents for <b>thermoplastic</b> articles)   |      |          |                 |          |
| IT   | Plastics, properties<br>RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)<br>( <b>thermoplastics</b> ; bicyclo[2.2.1]heptane dicarboxylate salt <b>nucleating</b> agents for <b>thermoplastic</b> articles)  |      |          |                 |          |
| IT   | 465508-47-8P 465508-50-3P 465508-53-6P<br>465508-55-8P 465508-60-5P 466646-10-6P 466646-11-7P  |      |          |                 |          |



RL: IMF (Industrial manufacture); MOA (Modifier or additive use)  
 ; PREP (Preparation); USES (Uses)  
 (bicyclo[2.2.1]heptane dicarboxylate salt **nucleating agents**  
 for **thermoplastic** articles)

IT 1724-08-9P 23838-83-7P  
 RL: IMF (Industrial manufacture); MOA (Modifier or additive use)  
 ; RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES  
 (Uses)  
 (bicyclo[2.2.1]heptane dicarboxylate salt **nucleating agents**  
 for **thermoplastic** articles)

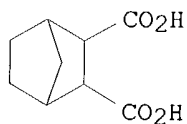
IT 25038-59-9, Cleartuf 8006, properties 25085-53-4, Profax 6301  
 RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or  
 engineered material use); USES (Uses)  
 (bicyclo[2.2.1]heptane dicarboxylate salt **nucleating agents**  
 for **thermoplastic** articles)

IT 57-88-5, Cholesterol, reactions 2746-19-2, Himic anhydride 23838-82-6  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (bicyclo[2.2.1]heptane dicarboxylate salt **nucleating agents**  
 for **thermoplastic** articles)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE  
 (1) Amos; US 5922793 A 1999 HCAPLUS  
 (2) Boelens; US 4442025 A 1984 HCAPLUS  
 (3) Broekhof; US 4843061 A 1989 HCAPLUS  
 (4) de Witt; US 3686361 A 1972  
 (5) Kolbl; US 4647581 A 1987 HCAPLUS  
 (6) Ohtani; US 5047574 A 1991 HCAPLUS  
 (7) Ruyter; US 3560411 A 1971 HCAPLUS

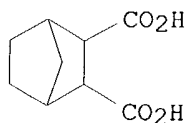
IT 465508-47-8P 465508-50-3P 465508-53-6P  
 465508-55-8P  
 RL: IMF (Industrial manufacture); MOA (Modifier or additive use)  
 ; PREP (Preparation); USES (Uses)  
 (bicyclo[2.2.1]heptane dicarboxylate salt **nucleating agents**  
 for **thermoplastic** articles)

RN 465508-47-8 HCAPLUS  
 CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, calcium salt (1:1) (9CI) (CA  
 INDEX NAME)



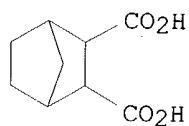
● Ca

RN 465508-50-3 HCAPLUS  
 CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, monosodium salt (9CI) (CA  
 INDEX NAME)



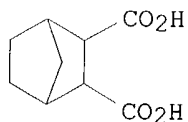
● Na

RN 465508-53-6 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, monolithium salt (9CI) (CA INDEX NAME)



● Li

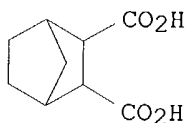
RN 465508-55-8 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, lithium sodium salt (9CI) (CA INDEX NAME)



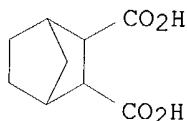
● Li

● Na

IT 1724-08-9P 23838-83-7P  
RL: IMF (Industrial manufacture); MOA (Modifier or additive use)  
; RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES  
(Uses)  
(bicyclo[2.2.1]heptane dicarboxylate salt nucleating agents  
for thermoplastic articles)  
RN 1724-08-9 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid (9CI) (CA INDEX NAME)



RN 23838-83-7 HCAPLUS  
 CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, disodium salt (9CI) (CA  
 INDEX NAME)



●2 Na

L21 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN  
 AN 1994:511558 HCAPLUS  
 DN 121:111558  
 ED Entered STN: 03 Sep 1994  
 TI Coating compositions containing polyesters and chlorinated polypropene  
 IN Tanioku, Katsuzo; Tono, Tetsuji; Kubo, Keiji; Matsumoto, Mitsuo  
 PA Arakawa Chem Ind, Japan; Kuraray Co  
 SO Jpn. Kokai Tokkyo Koho, 6 pp.  
 CODEN: JKXXAF

DT Patent  
 LA Japanese  
 IC ICM C09D175-06  
 ICS C09D123-28; C09D167-00; C09D175-04  
 CC 42-8 (Coatings, Inks, and Related Products)  
 FAN.CNT 1

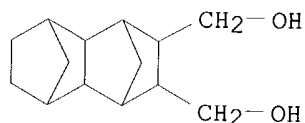
|      | PATENT NO.     | KIND | DATE     | APPLICATION NO. | DATE     |
|------|----------------|------|----------|-----------------|----------|
| PI   | JP 06049411    | A2   | 19940222 | JP 1992-205638  | 19920731 |
|      | JP 3203055     | B2   | 20010827 |                 |          |
| PRAI | JP 1992-205638 |      | 19920731 |                 |          |

AB The compns. contain ≥40% polyesters having norbornylene or perhydro-1,4:5,8-dimethanonaphthylene units and chlorinated polypropene (10-70% Cl) in 97:3-30:70 ratio as well as 0-40 phr polyisocyanates. A mixture of 67.5 parts polyester prepared from 100 parts perhydro-1,4:5,8-dimethanonaphthalene-2,3-dicarboxylic acid, 30 parts perhydro-1,4:5,8-dimethanonaphthalene-2,3-dimethanol, and 70 parts 1,6-hexanediol, 13 parts chlorinated isotactic polypropene (30% Cl), 4 parts isophorone diisocyanate, and 30 parts TiO<sub>2</sub> was applied to a polypropene sheet to give a coating showing good adhesion and resistance to gasoline and alc. solvents.

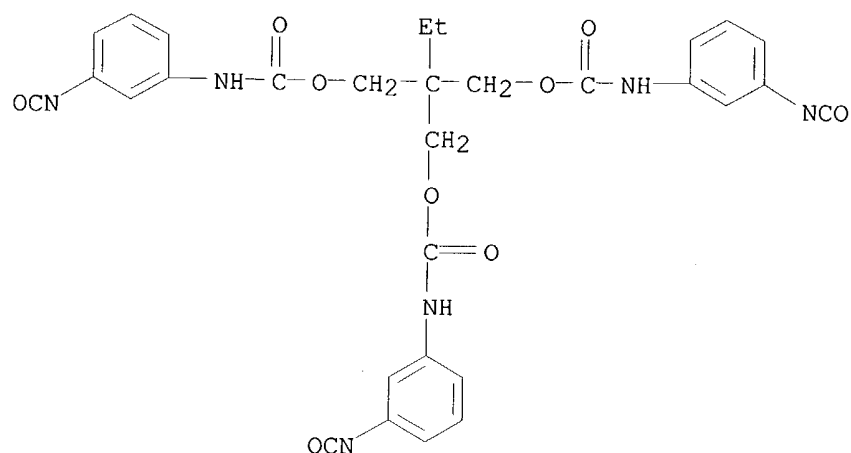
ST chlorinated polypropene polyester isocyanate coating; gasoline resistance coating chlorinated polypropene; alc resistance coating chlorinated polypropene; dimethanonaphthalene deriv polyester coating; naphthalene dimethano deriv polyester coating

IT Polyesters, uses

RL: USES (Uses)  
 (coatings containing chlorinated polypropene and, solvent-resistant)  
 IT Coating materials  
 (solvent-resistant, polyester-chlorinated polypropene-polyisocyanate  
 compns. as)  
 IT 156381-70-3  
 RL: USES (Uses)  
 (coating compns. containing chlorinated polypropene and, solvent-resistant)  
 IT 25085-53-4D, Isotactic **polypropylene**, chlorinated  
 RL: USES (Uses)  
 (coating compns. containing polycyclic polyesters and)  
 IT 156381-67-8 156381-68-9 **156381-69-0**  
 RL: USES (Uses)  
 (coatings containing chlorinated polypropene and, solvent-resistant)  
 IT 9003-07-0D, **Polypropylene**, chlorinated  
 RL: USES (Uses)  
 (coatings containing polycyclic polyesters and, gasoline- and  
 alc.-resistant)  
 IT 9003-07-0, **Polypropylene**  
 RL: USES (Uses)  
 (coatings for, solvent-resistant)  
 IT 156381-63-4P 156381-64-5P **156381-65-6P** 156381-66-7P  
 RL: PREP (Preparation)  
 (preparation of, for solvent-resistant coatings)  
 IT **156381-69-0**  
 RL: USES (Uses)  
 (coatings containing chlorinated polypropene and, solvent-resistant)  
 RN 156381-69-0 HCAPLUS  
 CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, polymer with  
 decahydro-1,4:5,8-dimethanonaphthalene-2,3-dimethanol,  
 2,2-dimethyl-1,3-propanediol and 2-ethyl-2-[[[(3-  
 isocyanatomethylphenyl)amino]carbonyl]oxy]methyl]-1,3-propanediyl  
 bis[(3-isocyanatomethylphenyl)carbamate] (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 37501-78-3  
 CMF C14 H22 O2



CM 2  
 CRN 28805-80-3  
 CMF C33 H32 N6 O9  
 CCI IDS

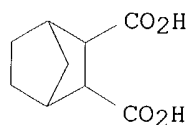


3 ( D1-Me )

CM 3

CRN 1724-08-9

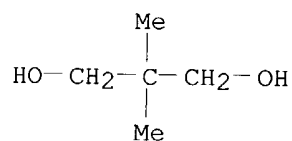
CMF C9 H12 O4



CM 4

CRN 126-30-7

CMF C5 H12 O2



IT 156381-65-6P

RL: PREP (Preparation)

(preparation of, for solvent-resistant coatings)

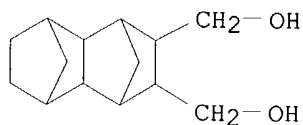
RN 156381-65-6 HCAPLUS

CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, polymer with decahydro-1,4:5,8-dimethanonaphthalene-2,3-dimethanol and 2,2-dimethyl-1,3-propanediol (9CI) (CA INDEX NAME)

CM 1

CRN 37501-78-3

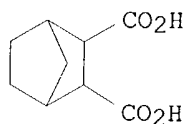
CMF C14 H22 O2



CM 2

CRN 1724-08-9

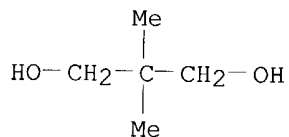
CMF C9 H12 O4



CM 3

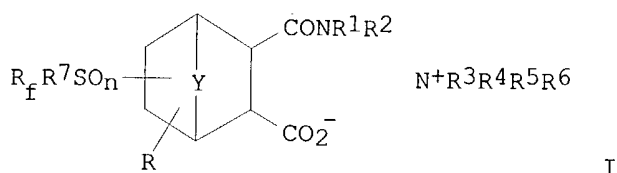
CRN 126-30-7

CMF C5 H12 O2



L21 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN  
 AN 1987:121679 HCAPLUS  
 DN 106:121679  
 ED Entered STN: 17 Apr 1987  
 TI Compositions and uses of bicyclic aliphatic amide acid amine salts  
 substituted with fluoroaliphatic thio, sulfinyl, or sulfonyl groups  
 PA Ciba-Geigy A.-G., USA  
 SO Jpn. Kokai Tokkyo Koho, 18 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM C07C147-05  
 ICS C07C147-14; C07C149-26; D21H003-08  
 ICA C07C087-30; C07C091-26; C07D307-77  
 CC 43-7 (Cellulose, Lignin, Paper, and Other Wood Products)  
 Section cross-reference(s): 24  
 FAN.CNT 1

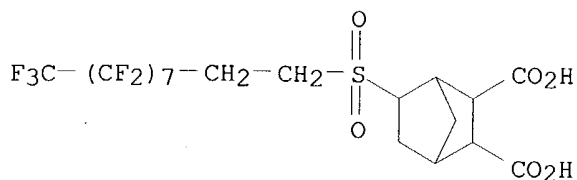
|      | PATENT NO.                    | KIND | DATE     | APPLICATION NO. | DATE     |
|------|-------------------------------|------|----------|-----------------|----------|
| PI   | JP 60008255                   | A2   | 19850117 | JP 1984-120076  | 19840613 |
|      | US 4515640                    | A    | 19850507 | US 1983-503435  | 19830613 |
|      | EP 138748                     | A1   | 19850424 | EP 1984-810280  | 19840607 |
|      | EP 138748                     | B1   | 19870121 |                 |          |
|      | R: BE, CH, DE, FR, GB, IT, LI |      |          |                 |          |
|      | CA 1213587                    | A1   | 19861104 | CA 1984-456317  | 19840611 |
|      | US 4590129                    | A    | 19860520 | US 1985-692256  | 19850117 |
| PRAI | US 1983-503435                |      | 19830613 |                 |          |
| GI   |                               |      |          |                 |          |



- AB Compds. I are prepared which impart oil and water repellency to cellulosic and synthetic or natural polyamide materials. In I, R<sub>f</sub> = C<sub>4</sub>-18 perfluoroalkyl or perfluoroalkoxyperfluoroalkyl; R<sub>7</sub> = C<sub>1</sub>-12 alkylene, C<sub>2</sub>-12 alkyleneethioalkylene, C<sub>2</sub>-12 alkyleneoxyalkylene, or C<sub>2</sub>-12 alkyleneiminoalkylene (the imino N atom optionally containing C<sub>1</sub>-6 alkyl as the 3rd substituent); n = 0, 1, or 2; Y = lower alkylene or O; R<sub>1</sub>, R<sub>2</sub> = H, lower alkyl, lower hydroxyalkyl, or NR<sub>1</sub>R<sub>2</sub> = morpholino, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> = H, lower alkyl, lower hydroxyalkyl; R<sub>6</sub> = unsubstituted or OH-, CO<sub>2</sub>H-, or SO<sub>3</sub>H-substituted lower alkyl, benzyl, or NR<sub>3</sub>R<sub>4</sub> = morpholino; R = H or Me; and R<sub>f</sub>R<sub>7</sub>SO<sub>n</sub> groups are on the 5th or 6th position.
- ST oil water repellent cellulose material; polyamide material oil water repellent; bicyclic aliph amide acid salt; fluorine compd water oil repellent
- IT Bicyclic compounds  
 RL: USES (Uses)  
 (aliphatic amide acid amine salts containing fluorine and sulfur, oil- and water-repellents, for cellulosic and synthetic and natural polyamide materials)
- IT Sizes  
 (bicyclic aliphatic amide acid amine salts containing fluorine and sulfur, for paper, water- and oil-repellent)
- IT Polyamides, uses and miscellaneous  
 RL: USES (Uses)  
 (oil- and water-repellents for, bicyclic aliphatic amide acid amine salts containing fluorine and sulfur as)
- IT Emulsifying agents  
 (polyethylene propylene glycol, for bicyclic aliphatic amide acid amine salts containing fluorine and sulfur, for oil- and water-repellents)
- IT Amines, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with fluorine- and sulfo-containing bicyclic aliphatic anhydrides)
- IT Paper  
 (sizes for, containing bicyclic aliphatic amide acid amine salts containing fluorine and sulfur, water- and oil-repellent)

- IT Waterproofing  
 (agents, oilproofing and, bicyclic aliphatic amide acid amine salts  
 containing  
 fluorine and sulfur, for cellulosic and natural and synthetic polyamide  
 materials)
- IT Oilproofing  
 (agents, waterproofing and, bicyclic aliphatic amide acid amine salts  
 containing fluorine and sulfur, for cellulosic and natural and synthetic  
 polyamide materials)
- IT Anhydrides  
 RL: USES (Uses)  
 (aliphatic, bicyclic, fluorine- and sulfo-containing, reaction of, with  
 amines)
- IT **107241-41-8**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (dehydration of)
- IT 9003-11-6, **Polyethylene** propylene glycol  
 RL: USES (Uses)  
 (emulsifiers, Pluronic F-68, for bicyclic aliphatic amide acid amine salts  
 containing fluorine and sulfur, for oil- and water-repellents)
- IT 107163-28-0P 107241-40-7P  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (manufacture and reaction of, with amines)
- IT **107269-47-6**  
 RL: USES (Uses)  
 (oil and water repellents, for cellulosic and natural and synthetic  
 polyamide materials)
- IT 34143-74-3, 1,1,2,2-Tetrahydroperfluorodecanethiol  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with bicyclooctenedicarboxylic acid anhydride)
- IT 4883-79-8 107163-29-1 107173-51-3 107241-39-4 **107269-45-4**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with diethanolamine)
- IT 77-86-1 108-18-9 110-91-8, reactions 110-97-4 111-42-2, reactions  
 124-68-5 141-43-5, reactions 4316-74-9 90191-92-7  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with fluorine- and sulfo-containing bicyclic aliphatic  
 anhydrides)
- IT 24327-08-0  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with tetrahydroperfluorodecanthiol)
- IT **107241-41-8**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (dehydration of)
- RN 107241-41-8 HCAPLUS
- CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, 5-  
 [(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)sulfonyl]-1(or  
 6)-methyl- (9CI) (CA INDEX NAME)





Dl-Me

IT 107269-47-6

RL: USES (Uses)

(oil and water repellents, for cellulosic and natural and synthetic polyamide materials)

RN 107269-47-6 HCAPLUS

CN Bicyclo[2.2.1]heptane-2-carboxylic acid, 3-[[bis(2-hydroxyethyl)amino]carbonyl]-5(or 6)-[(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptafluorodecyl)thio]-, [2-endo,3-endo,5(or 6)-exo]-, compd. with 2,2'-iminobis[ethanol] (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 111-42-2

CMF C4 H11 N O2



CM 2

CRN 107269-46-5

CMF C23 H24 F17 N O5 S

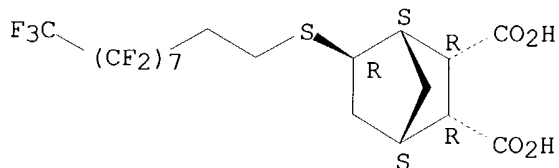
CCI IDS

CM 3

CRN 62731-97-9

CMF C19 H15 F17 O4 S

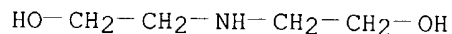
Relative stereochemistry.



CM 4

CRN 111-42-2

CMF C4 H11 N O2



IT 107269-45-4

RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with diethanolamine)

RN 107269-45-4 HCAPLUS

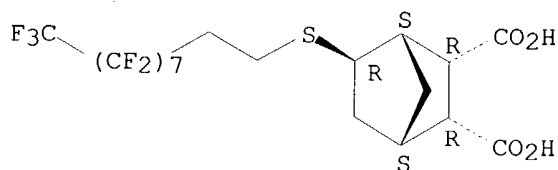
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, 5-  
[(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)thio]-,  
monomethyl ester, (2-endo,3-endo,5-exo)- (9CI) (CA INDEX NAME)

CM 1

CRN 62731-97-9

CMF C19 H15 F17 O4 S

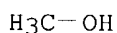
Relative stereochemistry.



CM 2

CRN 67-56-1

CMF C H4 O



L21 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1978:106017 HCAPLUS

DN 88:106017

ED Entered STN: 12 May 1984

TI Reacting isocyanates

IN Kresta, Jiri Erik; Shen, Chen Shyan

PA Dow Chemical Co., USA

SO Ger. Offen., 43 pp.

CODEN: GWXXBX

DT Patent

LA German

IC C08G018-00

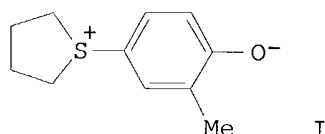
CC 35-4 (Synthetic High Polymers)

FAN.CNT 1

|    | PATENT NO. | KIND | DATE     | APPLICATION NO. | DATE     |
|----|------------|------|----------|-----------------|----------|
| PI | DE 2726779 | A1   | 19771222 | DE 1977-2726779 | 19770614 |
|    | US 4111914 | A    | 19780905 | US 1976-695897  | 19760614 |
|    | NL 7706477 | A    | 19771216 | NL 1977-6477    | 19770613 |
|    | NL 186251  | B    | 19900516 |                 |          |

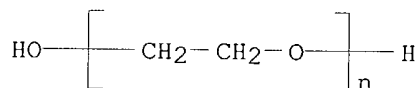
|                     |    |          |                |          |
|---------------------|----|----------|----------------|----------|
| NL 186251           | C  | 19901016 |                |          |
| BE 855667           | A1 | 19771214 | BE 1977-178427 | 19770614 |
| JP 52156801         | A2 | 19771227 | JP 1977-70385  | 19770614 |
| FR 2355040          | A1 | 19780113 | FR 1977-18232  | 19770614 |
| FR 2355040          | B1 | 19800411 |                |          |
| AU 7726073          | A1 | 19781221 | AU 1977-26073  | 19770614 |
| AU 512046           | B2 | 19800918 |                |          |
| CA 1071202          | A1 | 19800205 | CA 1977-280492 | 19770614 |
| GB 1586595          | A  | 19810325 | GB 1977-24761  | 19770614 |
| US 4220728          | A  | 19800902 | US 1978-890153 | 19780327 |
| US 4288562          | A  | 19810908 | US 1980-144737 | 19800428 |
| PRAI US 1976-695897 |    | 19760614 |                |          |
| US 1978-890153      |    | 19780327 |                |          |

GI



- AB Reactions of isocyanates with themselves, other isocyanates, or active-H compds. are catalyzed by arylsulfonium ar-oxides. For example, 712.6 parts PAPI 105 (P-containing polyisocyanate) was added to a mixture of Isonol
- 36 50, CFC13 80, and Silicone DC 193 10 parts and the resulting solution was treated with 12 parts initiator I [33127-79-6] in 50 parts **polyethylene** glycol of OH number 563.8 to give a foam with cream time 4 s, rise time 14 s, and tack-free time 14 s. After being cured 24 h at 100° and 1 wk at room temperature the rigid foam had d. 0.0338 g/cm<sup>3</sup>, brittleness 15.87%, and compressive strength 1.44 and 1.56 kg/cm<sup>2</sup> parallel and at right angles to the direction of rise, resp.
- ST isocyanate reaction catalyst; arylsulfonium oxide catalyst; polymn catalyst isocyanate; polyurethane foam
- IT Polymerization catalysts  
(arylsulfonium oxides, for isocyanates)
- IT Rubber, urethane, preparation  
Urethane polymers, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(manufacture of, catalysts for)
- IT 33127-77-4 33127-79-6 33127-80-9 65292-51-5 65717-82-0  
RL: CAT (Catalyst use); USES (Uses)  
(catalysts, for polymerization of isocyanates)
- IT 584-84-9DP, partially trimerized, polymers with polyether polyols 9082-00-2DP, polymer with Niox 34-28 and partially trimerized TDI 39289-81-1DP, polymer with Niox 11-34 and partially trimerized TDI 65876-35-9P **65876-38-2P**  
RL: PREP (Preparation)  
(cellular, manufacture of, catalysts for)
- IT 9017-01-0P 27616-41-7P 28182-81-2P 32010-01-8P 55637-24-6P  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(manufacture of, catalysts for)
- IT 67-63-0, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with hexamethylene diisocyanate, catalysts for)
- IT 71-23-8, reactions 7732-18-5, reactions

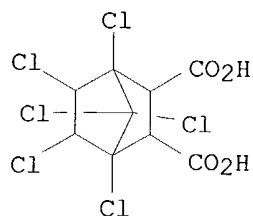
RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with phenyl isocyanate, catalysts for)  
 IT 64-17-5, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with tolylene diisocyanate, catalysts for)  
 IT 103-71-9, uses and miscellaneous 822-06-0 26471-62-5  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reactions of, catalysts for)  
 IT 25190-06-1DP, polymer with partially trimerized TDI  
 RL: PREP (Preparation)  
 (rubber, manufacture of, catalysts for)  
 IT **65876-38-2P**  
 RL: PREP (Preparation)  
 (cellular, manufacture of, catalysts for)  
 RN 65876-38-2 HCAPLUS  
 CN Isocyanic acid, polymethylenepolyphenylene ester, polymer with  
 $\alpha$ -hydro- $\omega$ -hydroxypoly(oxy-1,2-ethanediyl) and methyloxirane  
 polymer with oxirane 1,4,5,6,7,7-hexachlorobicyclo[2.2.1]heptane-2,3-  
 dicarboxylate (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 25322-68-3  
 CMF (C2 H4 O)<sub>n</sub> H2 O  
 CCI PMS



CM 2  
 CRN 9016-87-9  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 3  
 CRN 68439-27-0  
 CMF C9 H6 Cl6 O4 . x (C3 H6 O . C2 H4 O)<sub>x</sub>  
 CM 4  
 CRN 2424-95-5  
 CMF C9 H6 Cl6 O4



CM 5

CRN 9003-11-6

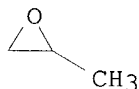
CMF (C3 H6 O . C2 H4 O)x

CCI PMS

CM 6

CRN 75-56-9

CMF C3 H6 O



CM 7

CRN 75-21-8

CMF C2 H4 O



L21 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN  
 AN 1973:516480 HCAPLUS  
 DN 79:116480  
 ED Entered STN: 12 May 1984  
 TI Surfactants containing terpenyl groups. IV. Synthesis and surface activity of anionic and nonionic surfactants from Diels-Alder adducts of alkyl isobornyl maleate with various dienes  
 AU Matsubara, Yoshiharu; Yamamoto, Shigemi; Minematsu, Wasaku; Adachi, Akemi; Kono, Nobuki  
 CS Fac. Sci. Technol., Kinki Univ., Higashi-Osaka, Japan  
 SO Yukagaku (1973), 22(6), 311-15  
 CODEN: YKGKAM; ISSN: 0513-398X  
 DT Journal  
 LA Japanese  
 CC 46-3 (Surface Active Agents and Detergents)  
 Section cross-reference(s): 30  
 AB Fifteen anionic surfactants were prepared by heating and stirring (at 100.deg. for 4-8 hr) mixts. of sodium hydrogen sulfite [7631-90-5] and

Diels-alder adducts prepared from alkyl isobornyl maleates (alkyl = Et, Bu, or 2-ethylhexyl) and 1,3-butadiene [106-99-0], isoprene [78-79-5], cyclopentadiene [542-92-7], 1,3-p-menthadiene [99-86-5], or alloocimene [673-84-7]. Thirty nonionic surfactants were prepared by heating and stirring (at 60.deg. for 8 hrs) mixts. of **polyethylene glycol** [25322-68-3] (mol. weight 400 and 600) and the same adducts. Some of the surface properties of the anionic and nonionic surfactants prepared were comparable with those of Aerosol OT [577-11-7] and ABS, and Na (linear alkyl)benzenesulfonate, resp.

ST bisulfite addn isobornyl maleate; **polyethylene glycol** isobornyl maleate; anionic surfactant prepn property; nonionic surfactant prepn property; terpenyl surfactant prepn property; alkyl isobornyl maleate surfactant

IT Surface activity  
(of cyclohexanedicarboxylate derivs.)

IT 51197-80-9P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

IT 39775-88-7 39776-54-0 39776-56-2 39873-62-6 50622-15-6  
50622-16-7 50769-48-7 50769-49-8 50769-51-2 50769-64-7  
50769-65-8 50875-14-4 50875-15-5 50875-20-2 50928-29-5  
RL: PRP (Properties)  
(properties of)

IT 25322-68-3  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with cyclohexanedicarboxylates)

IT 7631-90-5  
RL: USES (Uses)  
(sulfonation with, of cyclohexanedicarboxylates)

IT 50769-53-4 50769-54-5 50769-56-7 50769-57-8 **50769-59-0**  
**50769-60-3** 50769-62-5 50769-63-6 50875-16-6 50875-17-7  
**50875-18-8** 50875-19-9 51160-78-2 51160-79-3 51160-80-6  
51160-82-8 51160-83-9 51178-37-1 51178-48-4 **51178-50-8**  
**51178-51-9** **51178-52-0** 51178-54-2 51178-55-3  
51178-56-4 51212-83-0 51261-76-8 51261-77-9 51262-45-4  
RL: PRP (Properties)  
(surface activity of)

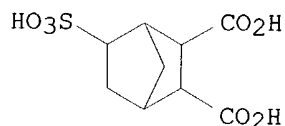
IT **50769-59-0** **50769-60-3** **50875-18-8**  
**51178-50-8** **51178-51-9** **51178-52-0**  
RL: PRP (Properties)  
(surface activity of)

RN 50769-59-0 HCAPLUS

CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, 5-sulfo-, 2(or 3)-butyl 3(or 2)-exo-1,7,7-trimethylbicyclo[2.2.1]hept-2-yl ester, sodium salt (9CI)  
(CA INDEX NAME)

CM 1

CRN 50769-58-9  
CMF C9 H12 O7 S

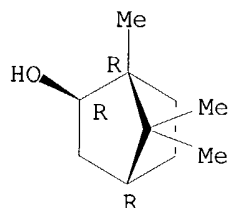


CM 2

CRN 124-76-5

CMF C10 H18 O

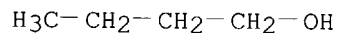
Relative stereochemistry.



CM 3

CRN 71-36-3

CMF C4 H10 O



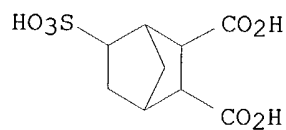
RN 50769-60-3 HCAPLUS

CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, 5-sulfo-, 2(or 3)-octyl 3(or 2)-exo-1,7,7-trimethylbicyclo[2.2.1]hept-2-yl ester, sodium salt (9CI)  
(CA INDEX NAME)

CM 1

CRN 50769-58-9

CMF C9 H12 O7 S

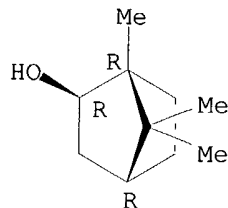


CM 2

CRN 124-76-5

CMF C10 H18 O

Relative stereochemistry.



CM 3

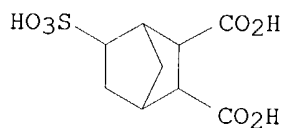
CRN 111-87-5  
CMF C8 H18 O

HO-(CH<sub>2</sub>)<sub>7</sub>-Me

RN 50875-18-8 HCAPLUS  
CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, 5-sulfo-, 2(or 3)-ethyl 3(or 2)-exo-1,7,7-trimethylbicyclo[2.2.1]hept-2-yl ester, sodium salt (9CI)  
(CA INDEX NAME)

CM 1

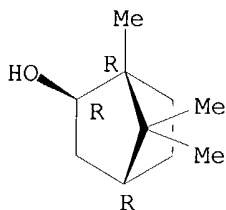
CRN 50769-58-9  
CMF C9 H12 O7 S



CM 2

CRN 124-76-5  
CMF C10 H18 O

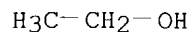
Relative stereochemistry.



CM 3



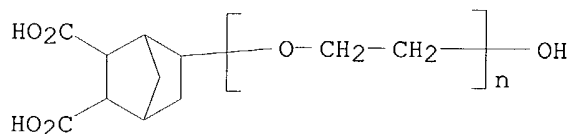
CRN 64-17-5  
CMF C2 H6 O



RN 51178-50-8 HCAPLUS  
CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -(5,6-dicarboxybicyclo[2.2.1]hept-2-yl)- $\omega$ -hydroxy-, ethyl 1,7,7-trimethylbicyclo[2.2.1]hept-2-yl ester, exo-(9CI) (CA INDEX NAME)

CM 1

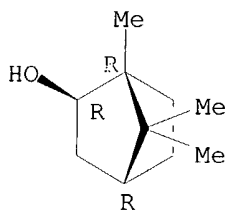
CRN 51178-49-5  
CMF (C2 H4 O)<sub>n</sub> C9 H12 O5  
CCI PMS



CM 2

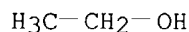
CRN 124-76-5  
CMF C10 H18 O

Relative stereochemistry.



CM 3

CRN 64-17-5  
CMF C2 H6 O



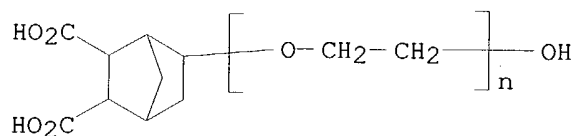
RN 51178-51-9 HCAPLUS  
CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -(5,6-dicarboxybicyclo[2.2.1]hept-2-yl)- $\omega$ -hydroxy-, butyl 1,7,7-trimethylbicyclo[2.2.1]hept-2-yl ester, exo-(9CI) (CA INDEX NAME)

CM 1

CRN 51178-49-5

CMF (C2 H4 O)n C9 H12 O5

CCI PMS

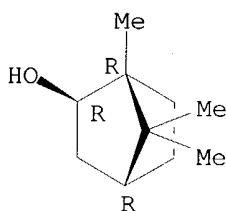


CM 2

CRN 124-76-5

CMF C10 H18 O

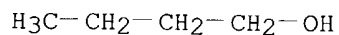
Relative stereochemistry.



CM 3

CRN 71-36-3

CMF C4 H10 O



RN 51178-52-0 HCAPLUS

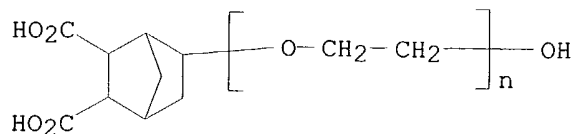
CN Poly(oxy-1,2-ethanediyl),  $\alpha$ -(5,6-dicarboxybicyclo[2.2.1]hept-2-yl)- $\omega$ -hydroxy-, octyl 1,7,7-trimethylbicyclo[2.2.1]hept-2-yl ester, exo-(9CI) (CA INDEX NAME)

CM 1

CRN 51178-49-5

CMF (C2 H4 O)n C9 H12 O5

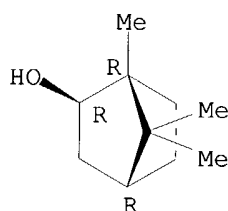
CCI PMS



CM 2

CRN 124-76-5  
CMF C10 H18 O

Relative stereochemistry.



CM 3

CRN 111-87-5  
CMF C8 H18 O

HO-(CH<sub>2</sub>)<sub>7</sub>-Me

L21 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 1965:420232 HCAPLUS  
DN 63:20232  
OREF 63:3600f-g  
ED Entered STN: 22 Apr 2001  
TI Thin-layer chromatography of dicarboxylic acids. IV. Combination of thin-layer chromatographic systems for the identification of individual components in dicarboxylic acid mixtures  
AU Knappe, E.; Rohdewald, I.  
CS Glasurit-Werke M. Winkelmann A.-G., Hilstrup, Germany  
SO Zeitschrift fuer Analytische Chemie (1965), 210(3), 183-93  
CODEN: ZANCA8; ISSN: 0372-7920  
DT Journal  
LA Unavailable  
CC 2 (Analytical Chemistry)  
AB cf. CA 58, 5021b. Mixts. of dicarboxylic acids can usually be analyzed by thin-layer chromatography with one of the following systems: (1) **polyethylene** glycol in kieselguhr with 90:7:3 iso-Pr2O-HCOOH-H2O; (2) polyamide powder with 50:20:20:8:1 iso-Pr2O-petr. ether-CCl4-HCOOH-H2O; (3) polyamide with 90:10:10 MeCN-EtOAc-HCOOH; (4) polyamide with 90:10:10 HCOOBu-EtOAc-HCOOH; and (5) silica gel with 90:7:3 iso-Pr2O-HCOOH-H2O. Widely separated Rf values can be effected by hydrogenation to yield addnl.

sepns. where appropriate.

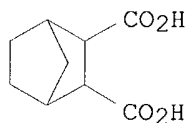
IT Acids  
 (in body fluids, chromatography of dicarboxylic)

IT 77-92-9, Citric acid 87-69-4, Tartaric acid 88-98-2,  
 4-Cyclohexene-1,2-dicarboxylic acid 88-99-3, Phthalic acid 97-65-4,  
 Succinic acid, methylene- 100-21-0, Terephthalic acid 110-15-6,  
 Succinic acid 110-16-7, Maleic acid 110-17-8, Fumaric acid 110-94-1,  
 Glutaric acid 111-16-0, Pimelic acid 111-20-6, Sebacic acid  
 115-28-6, 5-Norbornene-2,3-dicarboxylic acid, 1,4,5,6,7,7-hexachloro-  
 121-91-5, Isophthalic acid 123-99-9, Azelaic acid 124-04-9, Adipic  
 acid 141-82-2, Malonic acid 144-62-7, Oxalic acid 498-21-5, Succinic  
 acid, methyl- 498-23-7, Citraconic acid 498-24-8, Mesaconic acid  
 505-48-6, Suberic acid 528-44-9, 1,2,4-Benzenetricarboxylic acid  
 632-58-6, Phthalic acid, tetrachloro- 1687-30-5, 1,2-  
 Cyclohexanedicarboxylic acid 1724-02-3, Glutaconic acid  
**1724-08-9**, 2,3-Norbornanedicarboxylic acid 3813-52-3,  
 5-Norbornene-2,3-dicarboxylic acid 6915-15-7, Malic acid 27044-05-9,  
 1,2,4,5-Benzenetetracarboxylic acid, butyl ester  
 (chromatography of)

IT **1724-08-9**, 2,3-Norbornanedicarboxylic acid  
 (chromatography of)

RN 1724-08-9 HCAPLUS

CN Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid (9CI) (CA INDEX NAME)



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